SoCalGas

A Sempra Energy utility®

Order Instituting Investigation into the November	)	Investigation 19-11-010
2019 Submission of Southern California Gas	)	
Company's Risk Assessment and Mitigation Phase.	)	

RISK ASSESSMENT MITGATION PHASE

WORKPAPERS TO

CHAPTER SCG-4

CUSTOMER & PUBLIC SAFETY

November 27, 2019

FARS and GES Incident Rates

Fatal accidents_FARS

Medium, Heavy duty	2013	2014	2015	2016
Total Fatal crash accidents (excl. bus and motocycles):	242	272	280	307
Total Fatal crash accidents involving third parties	216	251	254	275
VMT (100 million)	3305	3335	3353	3386
% of VMT - Medium Heavy duty	9%	9%	9%	9%
CA Fatal accident rate:	0.814	0.906	0.928	1.007
SCG VMT (100 million)	0.033	0.037	0.037	0.038
SCG Fatal accidents	0.027	0.034	0.035	0.038
SCG Fatal accidents involving third parties	0.024	0.031	0.031	0.034

Auto, compact, light duty	2013	2014	2015	2016
Total Fatal crash accidents (excl. bus and motocycles):	2557	2536	2817	3184
Total Fatal crash accidents involving third parties	1661	1624	1861	2091
VMT (100 million)	3305	3335	3353	3386
% of VMT - Auto, compact, light duty	89%	89%	89%	89%
CA Fatal accident rate:	0.869	0.854	0.944	1.057
SCG VMT (100 million)	0.341	0.355	0.351	0.330
SCG Fatal accidents	0.297	0.303	0.331	0.349
SCG Fatal accidents involving third parties	0.193	0.194	0.219	0.229

Nonfatal incidents

Medium Heavy duty	2013	2014	2015
Total nonfatal crash accidents with serious injury (excl. bus and motocycles):	14	22	13
VMT (100 million)	6582	6687	6836
% of VMT - Medium Heavy duty	9%	9%	9%
West nonfatal accident rate with serious injury:	0.024	0.037	0.021
SCG VMT (100 million)	0.033	0.037	0.037
SCG nonfatal accidents with serious injury	0.001	0.001	0.001

Auto, compact, light duty	2013	2014	2015
Total nonfatal crash accidents with serious injury (excl. bus and motocycles):	994	1066	1058
VMT (100 million)	6582	6687	6836
% of VMT - Auto, compact, light duty	89%	89%	89%
West nonfatal accident rate:	0.170	0.179	0.174
SCG VMT (100 million)	0.341	0.355	0.351
SCG nonfatal accidents with serious injuries	0.058	0.064	0.061

Pre-mitigation

Chapter	SCG-4
Risk	Customer and Public Safety

Single Point

ID	Activity	Project Life (In Years)	Cost Forecast (O&M, $M) 2022	Cost Forecast (Capital, $M) 2020	2021	2022	Pre-Mitigation Single Point LORE	CORE	% risk reduction (use if % risk addressed not available) (%)	Safety % addressed	% scope	% of effectiveness	Reliability % addressed	% scope	% of effectiveness	Financial ($M) % addressed	% scope	% of effectiveness	RSE Single Point	Post-Mitigation Single Point LORE	CORE
SCG-4-C6	Quality Assurance and Controls Program	1	1.29	0.00	0.00	0.00	0.48	1586		21.2%	12.0%	100.0%	0.0%	0.0%	0.0%	64.0%	12.0%	100.0%	15.06	0.49	1588.07
SCG-4-A1	Refresher Technician Training	1	0.52	0.00	0.00	0.00	0.48	1586		21.0%	0.1%	100.0%	0.0%	0.0%	0.0%	64.0%	0.1%	100.0%	0.31	0.48	1585.51
SCG-4-A2	Post-training Follow Up Field Evaluations	1	0.12	0.00	0.00	0.00	0.48	1586		21.0%	0.1%	100.0%	0.0%	0.0%	0.0%	64.0%	0.1%	100.0%	1.40	0.48	1585.51

Low Alternative

ID	Activity	Project Life (In Years)	Cost Forecast (O&M, $M) 2022	Cost Forecast (Capital, $M) 2020	2021	2022	Pre-Mitigation Low Alternative LORE	CORE	% risk reduction (use if % risk addressed not available) (%)	Safety % addressed	% scope	% of effectiveness	Reliability % addressed	% scope	% of effectiveness	Financial ($M) % addressed	% scope	% of effectiveness	RSE Low Alternative	Post-Mitigation Low Alternative LORE	CORE
SCG-4-C6	Quality Assurance and Controls Program	1	1.29	0.00	0.00	0.00	0.48	204.23		21.2%	12.0%	100.0%	0.0%	0.0%	0.0%	64.0%	12.0%	100.0%	2.74	0.49	206.78
SCG-4-A1	Refresher Technician Training	1	0.52	0.00	0.00	0.00	0.48	204.23		21.0%	0.1%	100.0%	0.0%	0.0%	0.0%	64.0%	0.1%	100.0%	0.06	0.48	204.21
SCG-4-A2	Post-training Follow Up Field Evaluations	1	0.12	0.00	0.00	0.00	0.48	204.23		21.0%	0.1%	100.0%	0.0%	0.0%	0.0%	64.0%	0.1%	100.0%	0.26	0.48	204.21

High Alternative

ID	Activity	Project Life (In Years)	Cost Forecast (O&M, $M) 2022	Cost Forecast (Capital, $M) 2020	2021	2022	Pre-Mitigation High Alternative LORE	CORE	% risk reduction (use if % risk addressed not available) (%)	Safety % addressed	% scope	% of effectiveness	Reliability % addressed	% scope	% of effectiveness	Financial ($M) % addressed	% scope	% of effectiveness	RSE High Alternative	Post-Mitigation High Alternative LORE	CORE
SCG-4-C6	Quality Assurance and Controls Program	1	1.29	0.00	0.00	0.00	0.48	3888		21.2%	12.0%	100.0%	0.0%	0.0%	0.0%	64.0%	12.0%	100.0%	35.60	0.49	3890.24
SCG-4-A1	Refresher Technician Training	1	0.52	0.00	0.00	0.00	0.48	3888		21.0%	0.1%	100.0%	0.0%	0.0%	0.0%	64.0%	0.1%	100.0%	0.74	0.48	3887.67
SCG-4-A2	Post-training Follow Up Field Evaluations	1	0.12	0.00	0.00	0.00	0.48	3888		21.0%	0.1%	100.0%	0.0%	0.0%	0.0%	64.0%	0.1%	100.0%	3.31	0.48	3887.67

SCG-4-C6	Quality Assurance and Controls Program								
Attribute	**Risk Reduction**			**Formula**	**Basis**			**Reference**	**Project Life**
			Total		**Scope**	**Effectiveness**	**Risk Addressed**		
Safety	% Scope	12%	3%	*based on QA data*	portion of the risk due to the after-meter incidents	based on QA data	after-meter risk based on SME Estimate motor vehicle risk based on national data	Fatality Analysis Reporting System (FARS) General Estimates System (GES) National Automotive Sampling System (NASS) Department of Transportation (DOT) National Highway Traffic Safety Administration (NHTSA) Federal Highway Administration (FHA) utility QA data	1
	% Effectiveness	100%							
	% Risk Addressed	21%							
Reliability	% Scope	n/a	n/a						
	% Effectiveness	n/a							
	% Risk Addressed	n/a							
Financial	% Scope	12%	8%						
	% Effectiveness	100%							
	% Risk Addressed	64%							

		Low Alternative	Single Point	High Alternative
Pre-Mitigation	LoRE		0.5	
	CoRE	204	1586	3888
	Risk Score	98	765	1875
Post-Mitigation	LoRE		0.5	
	CoRE	207	1588	3890
	Risk Score	102	785	1924
	RSE	3	15	36

SCG-4-A1	Refresher Technician Training								

Attribute	Risk Reduction			Formula	Basis			Reference	Project Life
			Total		Scope	Effectiveness	Risk Addressed		
Safety	% Scope	0.1%	0.02%	SME Estimate	portion of the risk due to the after-meter incidents	SME based on incident data	after-meter risk based on SME Estimate; motor vehicle risk based on national data	Fatality Analysis Reporting System (FARS); General Estimates System (GES); National Automotive Sampling System (NASS); Department of Transportation (DOT); National Highway Traffic Safety Administration (NHTSA); Federal Highway Administration (FHA); utility QA data	1
	% Effectiveness	100%							
	% Risk Addressed	21%							
Reliability	% Scope	n/a	n/a						
	% Effectiveness	n/a							
	% Risk Addressed	n/a							
Financial	% Scope	0.1%	0.06%						
	% Effectiveness	100%							
	% Risk Addressed	64%							

		Low Alternative	Single Point	High Alternative
Pre-Mitigation	LoRE		0.5	
	CoRE	204	1586	3888
	Risk Score	98	765	1875
Post-Mitigation	LoRE		0.5	
	CoRE	204	1586	3888
	Risk Score	98	764	1874
	RSE	0.1	0.3	0.7

SCG-4-A2	Post-training Follow Up Field Evaluations							
Attribute	**Risk Reduction**			**Formula**	**Basis**			**Reference**	**Project Life**
			Total		**Scope**	**Effectiveness**	**Risk Addressed**		
Safety	% Scope	0.1%							
	% Effectiveness	100%	0.02%						
	% Risk Addressed	21%			portion of the risk due to the after-meter incidents	SME based on incident data	after-meter risk based on SME Estimate motor vehicle risk based on national data	Fatality Analysis Reporting System (FARS) General Estimates System (GES) National Automotive Sampling System (NASS) Department of Transportation (DOT) National Highway Traffic Safety Administration (NHTSA) Federal Highway Administration (FHA) utility QA data	1
Reliability	% Scope	n/a		*SME Estimate*					
	% Effectiveness	n/a	n/a						
	% Risk Addressed	n/a							
Financial	% Scope	0.1%							
	% Effectiveness	100%	0.06%						
	% Risk Addressed	64%							

		Low Alternative	Single Point	High Alternative
Pre-Mitigation	LoRE		0.5	
	CoRE	204	1586	3888
	Risk Score	98	765	1875
Post-Mitigation	LoRE		0.5	
	CoRE	204	1586	3888
	Risk Score	98	764	1874
	RSE	0.3	1	3